A Grant from the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
entitled

Dust Subnode of the Small Bodies Discipline Node,
NASA Planetary Data System

FINAL REPORT

Date of Expiration: March 31, 1996

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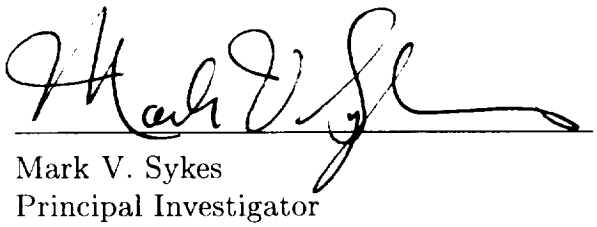

Mark V. Sykes
Principal Investigator

FINAL REPORT

Sykes operated the Dust Subnode of the Small Bodies Discipline Node of the PDS, providing the necessary scientific expertise and manpower to ingest NASA data on dust in addition to important ancillary data sets needed to understand them.

In addition to its PDS baseline activities, the Dust Subnode continued its ingestion of data from the Galileo and Ulysses dust detection systems (DDS), including instrument calibration files. We took receipt of the first 3 years of Galileo DDS data and the first 2 years of Ulysses DDS data and were able to identify and acquire all associated calibration files. Delivery to the PDS was ahead of the schedule laid out in the Galileo "Rules of the Road". In March 1996 we conducted a successful review of these data products by a telecon involving 16 scientists and PDS personnel distributed from California to Germany, identifying outstanding issues that need to be resolved to complete the ingestion process. This was enabled by the establishement of a Dust Subnode Website from which reviewers could access the data at their convenience and share comments in an associated "chat room" with other reviewers or interested parties (See Fig. 1). So much of the work of the review was accomplished in advance of the telecon.

During the telecon the DDS Principal Investigator, Eberhard Gruen, identified additional important data sets from the mission which they are now interested in making available to the science community through the PDS. These are the "noise" data files which is the complete record of events recorded by the Ulysses and Galileo dust experiments and represent a significant addition to our collection.

Access to the IRAS data holdings of PDS were greatly improved with the addition of extraction and search capabilities developed for the Dust Subnode website. Investigators are now able to download small subsets of data - corresponding to individual scans of the satellite. This has been made use of by scientists in the US and Europe.

A plotting package was developed allowing data to be plotted in real time over the WWW and was made available for many of the datasets residing on the Dust Subnode website (see Figure 2). This was a particularly valuable tool in the evaluation of the Galileo and Ulysses data by the reviewers and demonstrates how new information technologies can be utilized to increase efficiency in programmatic tasks - calling a traditional review meeting in which all of the participants would have to travel to a single location at PDS expense would have cost more than $5,000, whereas handling such procedures electronically and by telecon reduced costs by an order of magnitude (not to mention the considerable time saved).

The time-ordered data from the Diffuse Infrared Background Experiment (DIRBE) of COBE has been delivered to the Dust Subnode along with the DIRBE Weekly Skymaps (A total of about 15 Gbytes). This data provides critical measures of the zodiacal dust

complex. The Dust Subnode is working with Goddard on the longterm preservation and curation of this data.

Effort was also devoted to working with the Asteroid Subnode on the ingestion of some of their data products for which we have particular insight (e.g. the IRAS Minor Planet Survey). We also manage the Steward Observatory Asteroid Relational Database (SOARD) through which most scientists access the reviewed PDS asteroid data. We are in the process of transferring SOARD to a new database management system with a WWW interface and making it the official interface for PDS asteroid data (at which point it will have a new designation).

PDS DUST SUBNODE

The Dust Subnode is a part of the Small Bodies Discipline Node of the NASA Planetary Data System . We are located at the Steward Observatory of the University of Arizona . The Dust Subnode focusses on the ingestion and curation of data pertaining to interplanetary dust gathered by spacecraft and spacebased telescopes.

NOTES ON USING THIS PAGE

Hypertext links:
Mission -> PDS mission template, basically mission description information
Spacecraft -> PDS Instrument Host template or spacecraft description
Instrument -> PDS Instrument template, a description of the detector system
DATA SET NAME -> PDS data set template, describing the different data sets
LABEL -> PDS label describing the format of the data files and defines each variable
INDEX -> For binary files, the record identifier, start byte, and record length.
DATA -> The data.
SEARCH -> Search a particular data set within input parameter ranges.
PLOT -> Plot one parameter versus another over input ranges.

MISSIONS

Infrared Astronomical Satellite
Galileo Dust Detection System (DDS) - Under Review
Ulysses Dust Detection System (DDS) - Under Review
Cosmic Background Explorer - Diffuse Infrared Background Experiment (DIRBE) - In Preparation
Shoemaker-Levy 9 (Mid-Infrared Array Camera) - In Preparation

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Infrared Astronomical Satellite (IRAS)

●Mission ●Spacecraft ●Instrument

LOW RES ZODIACAL HISTORY FILE (ASCII)

Fig 1

Examine or extract the data or PDS label associated with an individual scan at 0.5 degree resolution in-scan:

SOP: OBS:

MEDIUM RES ZODIACAL HISTORY FILE (ASCII)

Examine or extract the data or PDS label associated with an individual scan at 2 arcminute resolution in-scan:

SOP: OBS:

LOW RES ZOD HIST FILE (Bin)	LABEL	INDEX		
MED RES ZOD HIST FILE (Bin)	LABEL	INDEX		
SCAN HISTORY FILE	LABEL	DATA	SEARCH	PLOT

SATELLITE POSITIONS FILE	LABEL	DATA

FOCAL PLANE DETECTORS FILE	LABEL	DATA

FILTER SPECTRAL RESPONSE

Band 1 (12 micron)	LABEL	DATA	PLOT
Band 2 (25 micron)	LABEL	DATA	PLOT
Band 3 (60 micron)	LABEL	DATA	PLOT
Band 4 (100 micron)	LABEL	DATA	PLOT

IRAS Astrophysical Data - IPAC

Galileo Dust Detection System

These data and data descriptions are under review with the PDS. Your comments on description clarity and accuracy as well as data accuracy are very welcome. Thank you.

Fig 1 cont

● Mission ● Spacecraft ●Instrument

DUST DETECTIONS FILE	LABEL	DATA	SEARCH	PLOT
DETECTION CODES	LABEL	DATA		
INSTRUMENT CALIBRATION	LABEL	DATA		PLOT
DETECTOR AREA SENSITIVITY	LABEL	DATA		PLOT

Current Mission Status

Ulysses Dust Detection System

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●Mission ●Spacecraft ●Instrument

DUST DETECTIONS FILE	LABEL	DATA	SEARCH	PLOT
DETECTION CODES	LABEL	DATA		
INSTRUMENT CALIBRATION	LABEL	DATA		PLOT
DETECTOR AREA SENSITIVITY	LABEL	DATA		PLOT

Current Mission Status

Cosmic Background Explorer (COBE)

Shoemaker-Levy 9 (Mid-Infrared Array Camera)

Fig 1 cont

Send comments/questions to *sykes@as.arizona.edu*

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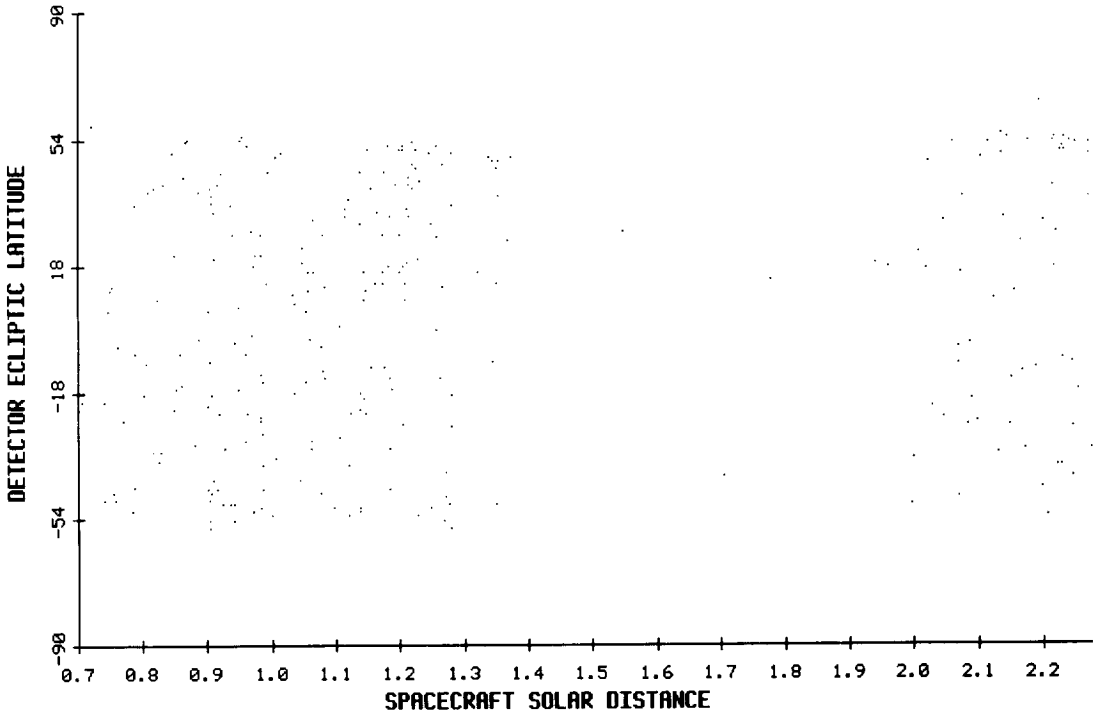
Fig 1 on

SPACECRAFT SOLAR DISTANCE *VS.* DETECTOR ECLIPTIC LATITUDE



X:

RANGE: MIN: MAX: **Tick Marks;**

Y:

RANGE: MIN: MAX: **Tick Marks:**

Graph Type: Scatter Plot Line Plot

Return to PDS Dust Subnode Main Page

Fig 2.